A multidisciplinary approach in psoriatic disease: the different models of Dermatology-Rheumatology collaborations in Portugal

Mendes-Bastos P[1], Nero P[2], Ferreira P[1], Bernardo A[3], Barcelos A[4], Pimentel dos Santos FM[5], Sousa J[6], Loureiro MM[7], Magina S[8], Alpalhão M[9], Antunes J[9], Vieira-Sousa E[10]

ACTA REUMATOL PORT. 2021;46:333-341

ABSTRACT

Psoriatic disease (psoriasis and psoriatic arthritis, PsD) is a condition that affects the skin, the musculoskeletal system, and beyond, impairing patients' quality of life. A multidisciplinary approach of combined dermatology–rheumatology clinics is recommended and valuable to respond to PsD diagnosis, management, and treatment challenges. In Portugal, five Hospitals have implemented a multidisciplinary clinic for PsD assessment. This report aims to describe how these multidisciplinary clinics were developed, their characteristics, and the main obstacles to their implementation. Although the different hospitals adopted distinct functional models, a consensus respecting the minimal core set assessment for PsD in Multidisciplinary Dermatology/Rheumatology Clinics should comprise all disease domains and, if possible, quality of life. The main objective of these clinics is to achieve remission/minimal disease activity. Limitations to these multidisciplinary approaches are discussed, namely financial, time management, and human resources obstacles that can be a handicap in their implementation, despite the benefits of PsD integrated care.

Keywords: Psoriatic Disease; Multidisciplinary; Management; Rheumatology; Dermatology; Portugal.

1. Centro de Dermatologia, Hospital CUF Descobertas, Lisboa, Portugal;
2. Serviço de Reumatologia, Hospital CUF Descobertas, Lisboa, Portugal;
3. Serviço de Reumatologia, Centro Hospitalar Universitário de São João, Porto;
4. Serviço de Reumatologia, Centro Hospitalar do Baixo Vouga, Aveiro, Portugal; NOVA National School of Public Health, Public Health Research Centre, Universidade NOVA de Lisboa, Portugal; Comprehensive Health Research Center (CHRC), Universidade NOVA de Li;
5. Serviço de Reumatologia, Centro Hospitalar de Lisboa Ocidental, Hospital de Egas Moniz, Lisboa, Portugal; NOVA Medical School|Faculdade de Ciências Médicas, Universidade NOVA de Lisboa, Portugal;
6. Serviço de Dermatologia, Centro Hospitalar de Lisboa Ocidental, Hospital de Egas Moniz, Lisboa, Portugal;
7. Serviço de Dermatologia, Centro Hospitalar do Baixo Vouga, Aveiro, Portugal;
8. Serviço de Dermatologia, Centro Hospitalar Universitário de São João, Porto, Portugal; Departamento de Farmacologia e Terapêutica, Faculdade de Medicina, Universidade do Porto, Portugal;
9. Serviço de Reumatologia, Hospital de Santa Maria, Centro Hospitalar Universitário de Lisboa Norte, Lisboa, Portugal;
10. Serviço de Reumatologia, Hospital de Santa Maria, Centro Hospitalar Universitário de Lisboa Norte, Lisboa, Portugal; Unidade de Investigação Reumatologia, Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina da Universidade de Lisboa, Portugal

INTRODUCTION

Psoriatic disease (PsD) is a heterogeneous condition that affects peripheral and axial joints and entheses (psoriatic arthriitis, PsA)[1] as well as the skin (psoriasis, PsO), associated with several systemic manifestations and comorbidities that altogether result in reduced health-related quality of life (HRQoL)[2]. Up to 40% of PsO patients will develop PsA[3-6], and 75% of PsA patients have clinically evident PsO when they are diagnosed[3, 7].

Early PsA diagnosis is associated with better radiographic and functional outcomes, reduced costs, and pain relief[8-11], while delayed diagnosis precludes optimal therapeutic response, including to biologic disease-modifying anti-rheumatic drugs (bDMARDs) and drugs with other mechanisms of action (MOA)[2, 12-14]. Despite the number of available diagnostic tools, some not yet completely validated, early and accurate diagnosis of PsA is often challenging to establish, due to the absence of well-characterized disease markers and/or a definitive screening procedure. Interpreting clinical symptoms[2] is frequently the only available tool for the decision-making process. Diagnosis can also be challenging

due to the heterogeneous nature of PsD manifestations and their multiple differential diagnoses[2]. Moreover, treatment of patients with PsD remains suboptimal, despite the evidence on early intervention effectiveness and effective therapeutic options[2, 3]. Thus, an early diagnosis, a regular assessment of disease activity, and an appropriate treatment aiming at remission, are essential for the management of PsD[2, 6, 15].

The evaluation and management of patients with PsD by dermatologists and rheumatologists are usually performed separately[7, 16]. In this context, the diagnosis and subsequent referral of the patient to a rheumatologist or dermatologist may be frequently delayed, being dependent on the knowledge and skill of the general practitioner (GP) or the dermatologist/rheumatologist to recognize the manifestations of PsA/PsO[12, 15].

Guidelines from the European Alliance of Associations for Rheumatology (EULAR), the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA), and the other groups endorsing Recommendations for the Coordinated Management of Psoriatic Arthritis by Rheumatologists and Dermatologists all recommend a multidisciplinary approach[5,17,18] based on PsA heterogeneous and potentially severe manifestations, as well as risk of irreversible structural damage. The outcome measures used in the follow-up of PsO and PsA patients are not consensual. Overall, these measures include unidimensional or multidimensional items that capture skin and musculoskeletal activity that dermatologists and rheumatologists, respectively, accurately use.

In line with these recommendations, five Hospitals in Portugal have implemented Multidisciplinary Dermatology/Rheumatology Clinics (MDRC) for the management of PsD: Centro Hospitalar Universitário de Lisboa Norte – Hospital de Santa Maria (CHULN-HSM), Lisboa (start date: July 2010); Centro Hospitalar Universitário de São João (CHUSJ), Porto (start date: January 2014); Hospital CUF Descobertas (CUF-D), Lisboa (start date: March 2016); Centro Hospitalar de Lisboa Ocidental – Hospital de Egas Moniz (CHLO-HEM), Lisboa (start date: March 2018); Centro Hospitalar Baixo Vouga – Hospital Infante D. Pedro (CHBV-HIP), Aveiro (start date: September 2018).

This manuscript aims to describe how these MDRC have been established in different Portuguese centers, detailing the distinct models and their main hurdles, as a tool to assist other centers in the implementation process of a joint Dermatology/Rheumatology Clinic.

METHODS

This is a clinical practice expert position paper. In February 2020, a panel of Dermatology and Rheumatology experts with experience in treating patients with PsO and PsA, respectively, met to discuss the management of patients with PsD. Due to the lack of scientific evidence, the primary source of information was the Experts' Opinion. The benefits of a collaborative approach to patients with PsD were debated and the experts decided to gather in this written manuscript the format of their clinics to document the main differences and commonalities identified in each MDRC in Portugal. The paper structure was debated and agreed upon in this presential meeting, whereas the following process was discussed in communication by email.

The final text was agreed upon in December 2020. All authors contributed and were actively involved in preparing the article.

RESULTS

MODELS OF MULTIDISCIPLINARY DERMATOLOGY/RHEUMATOLOGY CLINIC IMPLEMENTED IN PORTUGAL FOR ASSESSING PSORIATIC DISEASE

The five MDRC for PsD patients implemented in Portugal have specific characteristics, as reported in Table I, but all share similar objectives and referral criteria. The main objectives of these MDRC are: 1) to establish an early and definite skin and/or musculoskeletal (MSK) diagnosis in patients with suspected PsD; 2) to use the most effective therapy for both skin and MSK manifestations, minimizing adverse events for each patient; 3) to achieve PsD remission/minimal disease activity*.

*Several remission definitions for MSK manifestations based on different composite scores are in discussion without Consensus[19]. Therefore, the Rheumatology experts considered that an absence of inflammation for all MSK manifestations should be aimed. Regarding skin manifestations, there is currently no consensus about treatment goals in skin psoriasis, mainly resulting from a lack of correlative data concerning available criteria and patient satisfaction. However, some authors suggest that an absolute PASI ≤3 and a DLQI 0/1 should be attained[20].Ideally, disease modification using drugs that can shut down the biological processes involved in persistent psoriatic inflammation and potentially prevent comorbidities is currently the main therapeutic challenge. In this scenario, skin clearance that persists beyond the interruption of the drug could offer patients a true long-term, treatment-free skin remission[21].

TABLE I. CHARACTERISTICS OF THE 5 MDRC MODELS CURRENTLY IMPLEMENTED IN PORTUGAL

	CHULN, HSM	CHUSJ	CUF-D	CHLO, HEM	CHBV, HIP
Periodicity	Once a month	Once a month	Once a week	Once a month	Once a month
Consultation office	Patients are observed by the dermatologist and rheumatologists separately (3 offices in proximity)	Patients are observed by a dermatologist and a rheumatologist in the same room	Patients are observed by the dermatologist and rheumatologist separately	Patients are observed by a dermatologist and a rheumatologist in the same room	Patients are observed by a dermatologist and a rheumatologist in the same room
Team	One dermatologist and two rheumatologists and trainees from both specialties in rotation at this clinic	One dermatologist and one rheumatologist	Two dermatologists and one rheumatologist	One dermatologist and one rheumatologist, and trainees from both specialties in rotation at this clinic	One dermatologist, one rheumatologist, one nurse, and trainees from both specialties and general medicine in rotation at this clinic
Number of patients observed per day	Minimum of 12 patients	Minimum of 4 patients	3 patients	Variable (maximum 12 patients)	Minimum of 7 patients
Time	On the last Friday of each month (3 hours) (15 min with Dermatology; 30 min with Rheumatology, for each patient)	On the 4th Tuesday of each month (30 min for each patient)	Every Wednesday (20 min per patient for Dermatology and 20 min per patient for Rheumatology)	On the 1st Monday of each month (40 min for patients observed for the first time and 30 min for the remaining patients)	On the 2nd Thursday of each month (45 min for patients observed for the first time and 30 min for the remaining patients)
Registry	EMR using whenever possible the Reuma.pt and Derma.pt	EMR using SClínico	EMR using whenever possible the Reuma.pt	EMR using whenever possible the Reuma.pt	After filling out the patient report outcome in the shared EMR using whenever possible at Reuma.pt
Clinical Discussion	At the end of each patient assessment (with patient participation)	At the end of each patient assessment (with patient participation)	It occurs on the day of the MDRC	At the end of each patient assessment (with patient participation)	At the end of each patient assessment (with patient participation)
Main Objectives	Definite diagnosis Therapeutic decision Skin and MSK manifestations remission Increased HRQoL				

continues on the next page

TABLE I. CHARACTERISTICS OF THE 5 MDRC MODELS CURRENTLY IMPLEMENTED IN PORTUGAL

	CHULN, HSM	CHUSJ	CUF-D	CHLO, HEM	CHBV, HIP
Follow Up Visit*	As required	As required	Usually not, a follow-up visit with the referring specialist alone. Can be referred again if necessary	As required	As required
Payment	The patient pays for two consultations	The patient pays for one consultation	The patient pays for one consultation	The patient pays for two consultations	The patient pays for one consultation

CHUSJ- Centro Hospitalar Universitário de São João, Porto; CHLO-HEM - Centro Hospitalar de Lisboa Ocidental – Hospital de Egas Moniz, Lisboa CUF-D - Hospital CUF Descobertas, Lisboa; CHBV-HIP - Centro Hospitalar Baixo Vouga – Hospital Infante D. Pedro, Aveiro; MDRC-Multidisciplinary Dermatology/Rheumatology Clinic; MSK- musculoskeletal system; HRQoL- Health-related Quality of Life; EMR- Electronic Medical Registry

*After a first MDRC, patients can be reassessed in a follow up MDRC visits (evaluation of skin/nails biopsy, lab tests, ultrasound, MRI, or others) or if this is not required can be addressed to their dermatologist or rheumatologist assistant physician.

The general referral criteria for these MDRC are:

1. Patients with suspected PsO or PsA, without a definite diagnosis.
2. PsO or PsA patients with an established diagnosis but uncontrolled skin or MSK manifestations, respectively, for an improved treatment decision.
3. New skin or MSK manifestations in previously diagnosed and treated PsA or PsO patients for differential diagnosis.
4. The occurrence of an adverse event with current PsD medication that requires treatment modification.

The characteristics of the five different PsD disease MDRC models currently implemented in Portugal are summarized in Table I.

CONSENSUS ON MINIMAL CORE SET ASSESSMENT FOR PSORIATIC DISEASE

PsD involves distinct skin and MSK domains, reflecting a high disease heterogeneity that must be embraced in the regular assessment of patients[22]. The experts agreed that for a proper patient's follow up, it is essential to register the relevant information from distinct PsD manifestations in the hospitals Electronic Medical Registry (EMR), and whenever possible, in the national Rheumatic disease Portuguese Registry (Reuma.pt) and Dermatology (Derma.pt) registry. They also underlined that quality data in national registries could be a source to advance the research agenda in this complex disease.

Although different core set has been used and published in clinical trials, there is no consensus, regarding core set that should be used to assess psoriatic disease[23-26]. The described minimal core set outcome measures are included in Table II according to the experts leading these MDRCs.

DISCUSSION

AROUSING INTEREST IN A MULTIDISCIPLINARY APPROACH – A CALL FOR ACTION TO IMPROVE THE EFFECTIVE MANAGEMENT OF PSD

Different models of MDRC have been implemented in five Portuguese hospitals aiming to treat patients with PsD better. The main goal of these clinics is to promote early diagnosis and the control of PsA and PsO manifestations, fostering disease remission/low disease activity through pharmacologic and non-pharmacologic approaches[44]. It is closely related to the aim of treat-to-target medicine while avoiding exposing patients to un-

TABLE II. MINIMAL CORE SET ASSESSMENT FOR PSORIATIC DISEASE IN MDRC.

Manifestation	Outcome measures
Peripheral arthritis	- 68TJ/66SJ count[27]
Dactylitis	- DSS[28]
Enthesitis	- LEI[29] or SPARCC Enthesitis Index (peripheral phenotypes)[30] - MASES (axial phenotype)[31]
Axial disease	- BASDAI[32,33] - BASFI[34] - BASMI[35]
Systemic inflammation laboratory parameters	- ESR and/or CRP[36]
Skin/nails manifestations	- PASI[37] - BSA[38] - NAPSI[39]
Quality of life (optimal setting)	- DLQI[40] - PsAQoL[41-43]

PsA- Psoriatic arthritis; MSK – musculoskeletal system; 68TJ/66SJ count-Tender Joints count (0-68) and Swollen Joints count (0-66); DSS-Dactylitis Severity Score; LEI-Leeds Enthesitis Index; SPARCC - Spondyloarthritis Research Consortium of Canada; BASDAI- Bath Ankylosing Spondyloarthritis Disease Activity Index; BASFI -Bath Ankylosing Spondyloarthritis Functional Index; BASMI- Bath Ankylosing Spondyloarthritis Metrology Index; ESR- erythrocyte sedimentation rate; CRP- C reactive protein; PASI-Psoriasis Area and Severity Index; BSA- Body Surface Area; NAPSI- Nail Psoriasis Severity Index; DLQI-Dermatology Life Quality Index; PsAQoL-Psoriatic Arthritis Quality of Life

necessary procedures, delayed treatment introduction, and ineffective therapies[16, 45, 46]. This is even more important with the approval, over the last years, of a wide range of treatments, including bDMARDS and drugs with others MOA, that demonstrate different efficacy rates among the various PsD domains[13, 14, 47].

Thus it seems to be consensual, not only within the expert panel but only also in the literature, that patients benefit from a holistic approach and mutually supported decision while being evaluated jointly by a rheumatologist and a dermatologist in the same clinic[3,6,12,45,48]. As an example, a PsO diagnosis confirmed by a dermatologist, especially when the skin presentation of the disease is uncommon, can be an essential requirement, for the validation of a diagnosis of PsA by a rheumatologist, as well as for fulfilling the CASPAR criteria for classification purposes[47]. Furthermore, the differential diagnosis of a patient with PsA performed by a rheumatologist can influence therapeutic decisions by the dermatologist. Both patients with a difficult diagnosis or complex management of their disease can gain from this collaborative approach and all the advantages it entails[17]. MDRC has advantages over a referral to the Rheumatology or Dermatology department because early detection, understanding of the heterogeneity and potential severity, in particular, difficult to treat manifestations of PsD, demands a multidisciplinary clinical approach.

Therefore, it is essential to design referral criteria and patient management protocols to promote systematization and standardization of joint consultations to evaluate the benefits of this approach and provide better care to patients[7]. The implementation of the five MDRC in Portugal described in this work would be a reference that can be followed by other institutions, filling an essential gap in the treatment optimization of PsD patients and allowing standardization of care. Aiming to obtain objective data from MDRC, standardization of the outcomes measures is fundamental, and therefore the use of the minimum core set assessments should be used.

In Spain, the implementation of this consultation model happened some years ago and has shown promising results[7, 17, 49, 50]. During the first four years after implementing a PsO rheumatology and dermatology unit, a definitive diagnosis of PsA was made in 45% of the patients, including 24% of *de novo* disease. The change of diagnosis occurred in 32% of the cases and in 47% of patients, the multidisciplinary team decided to change the treatment: 45% changed the systemic therapy including conventional synthetic DMARDs, 12% changed the bDMARDs (switched or added a bi-

ologic agent), and 43% changed the topical agent[49].

In Italy, a two-year clinical experience of a derma-rheumatologic clinic showed that the therapeutic was changed in 73.3% of the patients after attending MCRD. In addition, the percentage of patients under bDMARDs changed from 24.14% before attending MCRD to 84% after 48 weeks of follow-up in the MCRD[18].

PsD is associated with disability and consequently with reduction of HRQoL[46]. A comparative population-based study (EpiReumaPt) conducted from 2011 to 2012 showed that the Portuguese adult patients with PsA had a worse HRQoL (p=0.031) and retired early (OR=4.95; 95% CI 1.54-15.93) than those with other rheumatic diseases[51].

This study highlights the impact of PsD on HRQoL and the indirect costs associated with the disease due to early retirement and absenteeism in Portuguese patients[51].

Therefore, a better control of PsD disease will impact not only the HRQoL but potentially reduce associated direct costs (as, for instance, inpatients admission, emergency department visits, outpatients visits) and indirect costs (income reduction, absenteeism, presenteeism, loss of work, early retirement, among others)[22, 45, 48, 52, 53].

Furthermore, it also maximizes the collaboration between physicians with different specializations[3], through joint delivery of information and decisions[7], helping to establish an integrated and patient-focused approach. MDRC becomes therefore a strategy with higher efficacy not only to obtain an accurate diagnosis, improve HRQoL, reduce costs[2, 16] but also to facilitate treatment regimens that are effective for both skin and MSK manifestations, taking into consideration individual response factors and multiple comorbidities[3].

It will ultimately lead to greater patient and healthcare professionals' satisfaction compared to conventional appointments[2, 7, 16, 45, 54].

Multidisciplinary consultations also allow better education of trainees, and other healthcare professionals, while contributing to innovation through multidisciplinary research[7, 49]. Of utmost importance, these clinics are also an opportunity to promote '" patient's education, foster the empowerment of patients, and allow their participation in the decision-making process[55].

For the success of MDRC, communication and registry of relevant information are fundamental. The communication should include the dermatologist, the rheumatologist, and the primary care physician, if applicable. The access to shared EMRs, colleagues' notes, and access to avenues for direct communication (e.g., institutional emails) are also a challenge in settings that are not integrated[3]. It would, therefore, be of interest to assess the results obtained in different settings and the creation of standardized protocols, including the minimal core set assessment of the multiple manifestations and joint patient registries, two measures that would make it possible to draw much more evidence from this kind of work with patients in daily practice[47].

OBSTACLES TO AN MCRD

There are several obstacles to the establishment of a multidisciplinary consultation for PsD patients. The lack of rheumatologists and/or dermatologists, and the type of organizational framework in which the multidisciplinary units are placed, not depending exclusively on one medical department, are two hurdles[6]. Also, the imbalances between the number of rheumatologists and dermatologists and the shared time with the same patient might prevent the dedication of a sufficient amount of time to patients with PsD[15].

The combination of schedules for both dermatologists and rheumatologists could be a challenge since, in general rheumatology assessments take more time than dermatology evaluations[2]. In Portugal, the implemented MCDR has a different number of patients per day with different durations according to the capacity of each hospital. Also, the time available for each patient varies with whether the two clinicians are or not together in the same room. Thereby, MCDR should be organized, maximizing physician time and in a cost-effective practice[3].

Finally, financial issues have to be considered, namely from the participation of two specialists in a single appointment , although the quantification of the economic viability of this option has not yet been studied[47]. The vast majority of providers bill through their departments, even in combined clinics, which results in patients often having to pay 2 consultations[3]. However, on the other hand, in MDRC, patients are observed by the two physicians on the same day which can provide faster and improved disease control and, therefore, potentially reducing hospital visits, saving travel costs, and decreasing work absenteeism. It will indeed impact not only the 'patient's HRQoL but potentially reduce the direct and indirect costs associated with PsD[45, 48, 52].

STRENGTHS AND LIMITATIONS

MDRC were implemented, independently, in five Por-

tuguese hospitals according with each reality and therefore they have the inherent variability to these circumstances. Since there is a lack of scientific evidence regarding the MDRC in Portugal, both the implementation and the source of information for this paper are the opinion of Portuguese Experts, with great experience and knowledge in treating patients with Psoriatic Disease. When this paper was submitted, we were informed that another joint consultation has been implemented in Hospital de Leiria, led by Dra Martinha Henrique (dermatologist) and Dra Marília Rodrigues (rheumatologist). Hopefully, this paper will serve as inspiration for other colleagues in Portugal to implement new dermatology-rheumatology joint consultations in order to optimize PsD care.

CONCLUSION

The benefits of a dermatology–rheumatology multidisciplinary approach in MDRC are consensual, among the consulted experts, due to the challenges in managing patients with PsD. In Portugal, at the moment, 5 MDRC are implemented to achieve earlier diagnosis of PsA, better management of therapeutic resources and comorbidities, and more successful education of patients. In the future, it will be essential to explore the real impact of these consultations to further evaluate the obstacles and benefits of MCDR.

CORRESPONDENCE TO
Pedro Mendes-Bastos
Centro de Dermatologia. Hospital CUF Descobertas.
Piso 5 - Edificio 2.
Rua Mário Botas.
E-mail: pmendesbastos@gmail.com

ACKNOWLEDGMENTS
Centro Hospitalar Universitário de Lisboa Norte - Hospital Santa Maria: To Professor Paulo Filipe e Professor João Eurico Fonseca that contributed to the establishment of this clinic. To all trainees that have collaborated in this clinic through the years.
Centro Hospitalar Universitário de S. João: To Dra. Lúcia Costa and Dra. Filomena Azevedo that strongly supported the implementation of this clinic.
Centro Hospitalar de Lisboa Ocidental, Hospital de Egas Moniz: To Professor Jaime C Branco and Dra Maria Isabel Faro Viana that supported the establishment of this clinic.
Centro Hospital do Baixo Vouga- Hospital Infante D. Pedro: To Enfermeira Maria Céu Almeida that has promptly collaborated in this clinic from the beginning.

REFERENCES

1. Jadon DR, Stober C, Pennington SR, FitzGerald O. Applying precision medicine to unmet clinical needs in psoriatic disease. Nature reviews Rheumatology. 2020;16(11):609-627.
2. Visalli E, Crispino N, Foti R. Multidisciplinary Management of Psoriatic Arthritis: The Benefits of a Comprehensive Approach. Advances in therapy. 2019;36(4):806-816.
3. Soleymani T, Reddy SM, Cohen JM, Neimann AL. Early Recognition and Treatment Heralds Optimal Outcomes: the Benefits of Combined Rheumatology-Dermatology Clinics and Integrative Care of Psoriasis and Psoriatic Arthritis Patients. Current rheumatology reports. 2017;20(1):1.
4. Canete JD, Puig L. Multidisciplinary teams for psoriatic arthritis: on aims and approaches. Actas dermo-sifiliograficas. 2014;105(4):325-327.
5. Canete JD, Dauden E, Queiro R, Aguilar MD, Sanchez-Carazo JL, Carrascosa JM, et al. Recommendations for the coordinated management of psoriatic arthritis by rheumatologists and dermatologists: a Delphi study. Actas dermo-sifiliograficas. 2014;105(3):216-232.
6. Queiro R, Coto P, Rodriguez J, Notario J, Navio Marco T, de la Cueva P, et al. Multidisciplinary Care Models for Patients With Psoriatic Arthritis. Reumatologia clinica. 2017;13(2):85-90.
7. Cobo-Ibanez T, Villaverde V, Seoane-Mato D, Munoz-Fernandez S, Guerra M, Del Campo PD, et al. Multidisciplinary dermatology-rheumatology management for patients with moderate-to-severe psoriasis and psoriatic arthritis: a systematic review. Rheumatology international. 2016;36(2):221-229.
8. Haroon M, Kirby B, FitzGerald O. High prevalence of psoriatic arthritis in patients with severe psoriasis with suboptimal performance of screening questionnaires. Annals of the rheumatic diseases. 2013;72(5):736-740.
9. Haroon M, Gallagher P, FitzGerald O. Diagnostic delay of more than 6 months contributes to poor radiographic and functional outcome in psoriatic arthritis. Annals of the rheumatic diseases. 2015;74(6):1045-1050.
10. Tillett W, Jadon D, Shaddick G, Cavill C, Korendowych E, de Vries CS, et al. Smoking and delay to diagnosis are associated with poorer functional outcome in psoriatic arthritis. Annals of the rheumatic diseases. 2013;72(8):1358-1361.
11. Theander E, Husmark T, Alenius GM, Larsson PT, Teleman A, Geijer M, et al. Early psoriatic arthritis: short symptom duration, male gender and preserved physical functioning at presentation predict favourable outcome at 5-year follow-up. Results from the Swedish Early Psoriatic Arthritis Register (SwePsA). Annals of the rheumatic diseases. 2014;73(2):407-413.
12. Queiro R, Coto P. Multidisciplinary care for psoriatic disease: Where we are and where we need to go. Rheumatology (Oxford, England). 2017;56(11):1829-1831.
13. Balato A, Campione E, Cirillo T, Malara G, Trifirò C, Bianchi L, et al. Long-term efficacy and safety of apremilast in psoriatic arthritis: Focus on skin manifestations and special populations. Dermatologic therapy. 2020;33(3):e13440.
14. Berekmeri A, Mahmood F, Wittmann M, Helliwell P. Tofacitinib for the treatment of psoriasis and psoriatic arthritis. Expert review of clinical immunology. 2018;14(9):719-730.
15. Betteridge N, Boehncke WH, Bundy C, Gossec L, Gratacos J, Augustin M. Promoting patient-centred care in psoriatic arthritis: a multidisciplinary European perspective on improving the patient experience. Journal of the European Academy of Dermatology and Venereology : JEADV. 2016;30(4):576-585.
16. Urruticoechea-Arana A, Serra Torres M, Hergueta Diaz M, Gonzalez Guerrero ME, Farinas Padron L, Navarro Martin S, et al. Experience and satisfaction with a multidisciplinary care unit for

patients with psoriasis an psoriatic arthritis. Reumatologia clinica. 2019;15(4):237-241.
17. Luelmo J, Gratacos J, Moreno Martinez-Losa M, Ribera M, Romani J, Calvet J, et al. A report of 4 years of experience of a multidisciplinary unit of psoriasis and psoriatic arthritis. Reumatologia clinica. 2014;10(3):141-146.
18. Luchetti MM, Benfaremo D, Campanati A, Molinelli E, Ciferri M, Cataldi S, et al. Clinical outcomes and feasibility of the multidisciplinary management of patients with psoriatic arthritis: two-year clinical experience of a dermo-rheumatologic clinic. Clinical rheumatology. 2018;37(10):2741-2749.
19. Mease PJ, Coates LC. Considerations for the definition of remission criteria in psoriatic arthritis. Seminars in arthritis and rheumatism. 2018;47(6):786-796.
20. Amatore F, Villani AP, Tauber M, Viguier M, Guillot B. French guidelines on the use of systemic treatments for moderate-to-severe psoriasis in adults. Journal of the European Academy of Dermatology and Venereology : JEADV. 2019;33(3):464-583.
21. van de Kerkhof PCM, Feldman SR. Our ambition in a changing landscape of psoriasis treatments. J Dermatolog Treat. 2020;31(2):105-107.
22. Tucker LJ, Coates LC, Helliwell PS. Assessing Disease Activity in Psoriatic Arthritis: A Literature Review. Rheumatology and therapy. 2019;6(1):23-32.
23. Gladman DD, Mease PJ, Strand V, Healy P, Helliwell PS, Fitzgerald O, et al. Consensus on a core set of domains for psoriatic arthritis. The Journal of rheumatology. 2007;34(5):1167-1170.
24. Callis Duffin K, Merola JF, Christensen R, Latella J, Garg A, Gottlieb AB, et al. Identifying a Core Domain Set to Assess Psoriasis in Clinical Trials. JAMA Dermatol. 2018;154(10):1137--1044.
25. Orbai AM, de Wit M, Mease P, Shea JA, Gossec L, Leung YY, et al. International patient and physician consensus on a psoriatic arthritis core outcome set for clinical trials. Annals of the rheumatic diseases. 2017;76(4):673-680.
26. Orbai AM, de Wit M, Mease PJ, Callis Duffin K, Elmamoun M, Tillett W, et al. Updating the Psoriatic Arthritis (PsA) Core Domain Set: A Report from the PsA Workshop at OMERACT 2016. The Journal of rheumatology. 2017;44(10):1522-1528.
27. Deandrade JR, Casagrande PA. A seven-day variability study of 499 patients with peripheral rheumatoid arthritis. Arthritis and rheumatism. 1965;8:302-334.
28. Antoni CE, Kavanaugh A, Kirkham B, Tutuncu Z, Burmester GR, Schneider U, et al. Sustained benefits of infliximab therapy for dermatologic and articular manifestations of psoriatic arthritis: results from the infliximab multinational psoriatic arthritis controlled trial (IMPACT). Arthritis and rheumatism. 2005;52(4):1227-1236.
29. Healy PJ, Helliwell PS. Measuring clinical enthesitis in psoriatic arthritis: assessment of existing measures and development of an instrument specific to psoriatic arthritis. Arthritis and rheumatism. 2008;59(5):686-691.
30. Maksymowych WP, Mallon C, Morrow S, Shojania K, Olszynski WP, Wong RL, et al. Development and validation of the Spondyloarthritis Research Consortium of Canada (SPARCC) Enthesitis Index. Annals of the rheumatic diseases. 2009;68(6):948-953.
31. Heuft-Dorenbosch L, Spoorenberg A, van Tubergen A, Landewé R, van ver Tempel H, Mielants H, et al. Assessment of enthesitis in ankylosing spondylitis. Annals of the rheumatic diseases. 2003;62(2):127-132.
32. Garrett S, Jenkinson T, Kennedy LG, Whitelock H, Gaisford P, Calin A. A new approach to defining disease status in ankylosing spondylitis: the Bath Ankylosing Spondylitis Disease Activity Index. The Journal of rheumatology. 1994;21(12):2286--2291.
33. Fernández-Sueiro JL, Willisch A, Pértega-Díaz S, Tasende JA, Fernández-López JC, Villar NO, et al. Validity of the bath ankylosing spondylitis disease activity index for the evaluation of disease activity in axial psoriatic arthritis. Arthritis care & research. 2010;62(1):78-85.
34. Calin A, Garrett S, Whitelock H, Kennedy LG, O'Hea J, Mallorie P, et al. A new approach to defining functional ability in ankylosing spondylitis: the development of the Bath Ankylosing Spondylitis Functional Index. The Journal of rheumatology. 1994;21(12):2281-2285.
35. Jenkinson TR, Mallorie PA, Whitelock HC, Kennedy LG, Garrett SL, Calin A. Defining spinal mobility in ankylosing spondylitis (AS). The Bath AS Metrology Index. The Journal of rheumatology. 1994;21(9):1694-1698.
36. Montaudié H, Albert-Sabonnadière C, Acquacalda E, Fontas E, Danré A, Roux C, et al. Impact of systemic treatment of psoriasis on inflammatory parameters and markers of comorbidities and cardiovascular risk: results of a prospective longitudinal observational study. Journal of the European Academy of Dermatology and Venereology : JEADV. 2014;28(9):1186-1191.
37. Fredriksson T, Pettersson U. Severe psoriasis--oral therapy with a new retinoid. Dermatologica. 1978;157(4):238-244.
38. Bo ek A, Reich A. The reliability of three psoriasis assessment tools: Psoriasis area and severity index, body surface area and physician global assessment. Advances in clinical and experimental medicine : official organ Wroclaw Medical University. 2017;26(5):851-856.
39. Rich P, Scher RK. Nail Psoriasis Severity Index: a useful tool for evaluation of nail psoriasis. Journal of the American Academy of Dermatology. 2003;49(2):206-212.
40. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI)--a simple practical measure for routine clinical use. Clinical and experimental dermatology. 1994;19(3):210-216.
41. Mease PJ. Measures of psoriatic arthritis: Tender and Swollen Joint Assessment, Psoriasis Area and Severity Index (PASI), Nail Psoriasis Severity Index (NAPSI), Modified Nail Psoriasis Severity Index (mNAPSI), Mander/Newcastle Enthesitis Index (MEI), Leeds Enthesitis Index (LEI), Spondyloarthritis Research Consortium of Canada (SPARCC), Maastricht Ankylosing Spondylitis Enthesis Score (MASES), Leeds Dactylitis Index (LDI), Patient Global for Psoriatic Arthritis, Dermatology Life Quality Index (DLQI), Psoriatic Arthritis Quality of Life (PsAQOL), Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F), Psoriatic Arthritis Response Criteria (PsARC), Psoriatic Arthritis Joint Activity Index (PsAJAI), Disease Activity in Psoriatic Arthritis (DAPSA), and Composite Psoriatic Disease Activity Index (CPDAI). Arthritis care & research. 2011;63 Suppl 11:S64--85.
42. McKenna SP, Doward LC, Whalley D, Tennant A, Emery P, Veale DJ. Development of the PsAQoL: a quality of life instrument specific to psoriatic arthritis. Annals of the rheumatic diseases. 2004;63(2):162-169.
43. Barcelos A, Ambrósio C, Pereira da Silva JA, McKenna S, Wilburn J, Lopes Ferreira P. Psoriatic Arthritis Quality of Life questionnaire: translation, cultural adaptation and validation into Portuguese language. Rheumatology international.

2018;38(2):249-254.
44. Velez NF, Wei-Passanese EX, Husni ME, Mody EA, Qureshi AA. Management of psoriasis and psoriatic arthritis in a combined dermatology and rheumatology clinic. Archives of dermatological research. 2012;304(1):7-13.
45. Gratacos J, Luelmo J, Rodriguez J, Notario J, Marco TN, de la Cueva P, et al. Standards of care and quality indicators for multidisciplinary care models for psoriatic arthritis in Spain. Rheumatology international. 2018;38(6):1115-1124.
46. Dures E, Shepperd S, Mukherjee S, Robson J, Vlaev I, Walsh N, et al. Treat-to-target in PsA: methods and necessity. RMD Open. 2020;6(1):e001083.
47. Lopez-Ferrer A, Laiz-Alonso A. Psoriasis-Arthritis Units: Three Years on. Actas dermo-sifiliograficas. 2018;109(2):101-103.
48. Cunha JS, Qureshi AA, Reginato AM. Management of Psoriasis and Psoriatic Arthritis in a Multidisciplinary Rheumatology/Dermatology Clinic. Federal practitioner : for the health care professionals of the VA, DoD, and PHS. 2015;32(Suppl 12):14S-20S.
49. Luelmo J, Gratacos J, Moreno Martinez-Losa M, Ribera M, Romani J, Calvet J, et al. Multidisciplinary psoriasis and psoriatic arthritis unit: report of 4 years' experience. Actas dermo-sifiliograficas. 2014;105(4):371-377.
50. Queiro R, Coto P, Joven B, Rivera R, Navio Marco T, de la Cueva P, et al. Current Status of Multidisciplinary Care in Psoriatic Arthritis in Spain: NEXUS 2.0 Project. Reumatologia clinica. 2018.
51. Rodrigues J, Rodrigues AM, Dias SS, Sousa RD, Branco JC, Canhão H. Psoriatic arthritis and ankylosing spondylitis impact on health-related quality of life and working life: a comparative population-based study. Acta reumatologica portuguesa. 2019;44(4):254-265.
52. Gratacos-Masmitja J, Luelmo-Aguilar J, Zarco-Montejo P, Botella-Estrada R, Carrizosa-Esquivel AM, Garcia-Vivar ML, et al. Points to Consider in the Foundation of Multidisciplinary Units for Psoriatic Arthritis: A Delphi Study and a Systematic Review of the Literature. Advances in therapy. 2017;33(12):2150-2159.
53. Lopes N, Dias LLS, Azulay-Abulafia L, Oyafuso LKM, Suarez MV, Fabricio L, et al. Humanistic and Economic Impact of Moderate to Severe Plaque Psoriasis in Brazil. Advances in therapy. 2019;36(10):2849-2865.
54. Baum EW, Schwartzman S. ALIGN PsA: Advancing a Multidisciplinary Approach in PsA. Seminars in cutaneous medicine and surgery. 2018;37(6S):S125-S34.
55. Haberman R, Perez-Chada LM, Merola JF, Scher J, Ogdie A, Reddy SM. Bridging the Gaps in the Care of Psoriasis and Psoriatic Arthritis: the Role of Combined Clinics. Current rheumatology reports. 2018;20(12):76.